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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/674,633	WORTHINGTON, JOHN W.
	Examiner	Art Unit
	Eric V. Woods	2672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, see Remarks pages 1-3 and applicant's amendments of the claims, filed 19 September 2005, with respect to the rejection(s) of claim(s) 1-32 under various statutes have been fully considered and are persuasive.

Therefore, the rejections of claims 1-2, 6-9, 17-18, and 22-25 under 35 U.S.C. 102 have been withdrawn in view of applicant's amendments of the claims, which are a narrowing amendment.

The rejections of claims 2 and 18 under 35 U.S.C. 112, first paragraph, stand withdrawn in view of applicant's amendments and the Remarks on page 1 regarding such amendments and explaining how they clarify certain points.

The rejections of claims 3-5, 10-16, 19-21, and 26-32 under 35 U.S.C. 103(a) stand withdrawn in view of applicant's amendments, which have significantly changed claim scope (narrowing amendment).

However, upon further consideration, a new ground(s) of rejection is made in view of various references as below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milliron in view of Jennings.

As to claim 1,

A computer implemented method, comprising:

-Receiving user input specifying a warping tool, the warping tool having a tool perimeter having a shape and a size, the warping tool having one or more associated tool vectors, each of the tool vectors originating at a mesh point defined by a tool mesh associated with the warping tool, the user input specifying one or more of the shape of the tool perimeter, the tool mesh, and the associated tool vectors, wherein movement of the warping tool within an image is controlled by user input, the tool perimeters defines a region of influence for the warping tool, and upon application of the warping tool to the image, the region of influence converts one or more pixels in the image and a warping effect is applied to the covered pixels based at least in part on the one or more tool vectors.

In regard to claim 1, Milliron discloses a method, apparatus, and computer program product for performing geometric warps and deformations. Paragraphs 72 and

75 of Milliron describe a vertex mesh in which a warping function will move the vertices of the mesh to new positions in space. Paragraph 75 states, "One simple deforming function convenient in some instances is a displacement model. For instance, the output of the warp may be generated with a vector-valued function defined on the domain U. The displacement model can then be added to the undeformed model to yield the deformed model." Thus, the warping tool of Milliron includes having one or more associated vectors, each of the vectors originating at a mesh point defined by a tool mesh associated with the warping tool. Paragraph 181 further describes the deformation meshes as being of any arbitrary topology and genus. "To further illustrate our mesh warp, the following points are noted about a preferred embodiment: First, our warp allows deformation meshes of arbitrary topology and genus to be used... Thirdly, our warp is defined spatially. This means that to create a deformation on an object, the only requirement is that the deformation mesh is located near the object to be deformed." An example of a deformation mesh containing a figure can be seen in Figures 2A and 2B. As can be seen, the mesh-warping tool has a perimeter, shape, and a size. Paragraph 77 states, "The invention is not limited to particular types of features. In preferred embodiments a warp designer selects the set of feature specifications; this aspect is limited only by the warp designer's ingenuity." Paragraph 118 discloses, "An illustrative implementation could involve a warp designer specifying each of n transformations strength field and weighing fields as a vector with m scalar elements (where m is a discrete number of model points, i.e. one value per point)." Paragraph 119 additionally states, "Independent of construction function, the warp

designer preferably specifies a sampling algorithm used by the sampling function 7450. No particular sampling algorithm is fundamental to carrying on the invention. The best sampling algorithm depends on the needs of the warp designer and the model representation. In some instances uniform sampling could be used, as could adaptive methods such as quad trees or irregular sampling. The sampling function 7450 receives the set of parameterized transformations 7300, the set of strength fields 7350, the set of weighting fields 7400 and the undeformed model 7150 and uses the sampling algorithm to output a set of discretized transformations 7500, a set of sampled strength fields 7550, and a set of sampled weighting fields 7600." Lastly, Paragraph 70 states, "The computer system 1000 also comprises an input/output device controller 1400 communicatively coupled with the bus 1600 and configured for controlling input/output from devices. The input/output device controller 1400 may operate with, for instance, a keyboard 1710, a display 1720, a data network 1730, and a pointing device 1740." Therefore, Milliron teaches of specifying one or more of the shape of the perimeter, the tool mesh, and the associated vectors of a warping function by user input by allowing a warp designer to specify strength and weighing fields as a vector with scalar elements.

Further, Milliron clearly uses tool vectors, since Milliron Figures 5A-5B, 11A-11B, and 12A/12B as shown therein, since the user can specify directions from a certain point having a certain magnitude and the tool will warp the image in those directions. Further, the user can set the parameters of such vectors, as in [0094-0098]. Further, as specified in [0094], the warp designer may describe such using any combination of basis vectors and frame origins, as well as translate, rotate, scale, and shear

components, etc. These clearly define a vector, since a vector only requires a magnitude and a direction, which such data would clearly provide, along with the basis **vector**.

Secondly, it is well known in the art to have the user be able to specify the perimeter of a modification field, and if Milliron clearly teaches that the user can specify the warping field as in Figure 3A, where the user specifies the width of the warp region and other proportions by setting the value of the strength field [0083], where the user sets the source feature and target feature, as noted in the discussion in [0084], where the example of Figures 2A-2B is explained where a warp is applied, such that a simple translation occurs. The system of Milliron generates a weighting field that applies to the plural elements [0086], which clearly manipulates the relative influence of the scaled transforms. This would qualify as allowing the user to specify the shape of the warping field, and further the user can also control the mesh [0016], and in [0072] the mesh can be manipulated by user, and can represent a polygonal model, since in [0130] Milliron teaches **away** from using a fixed-density control lattice, this would clearly set forth that the user could specify the density of the control mesh, e.g. the coarse mesh otherwise specified by Milliron.

Jennings clearly teaches in [0073] that the user specifies a sub-volume using a user-controlled stylus, and that in combination, the user can set the radius of influence, and can also draw a closed curve using a pointing device such a mouse that would all specify the region of influence. This clearly meets the limitation that the tool perimeter defines a region of influence for the warping tool. Further, this clearly sets forth that the

user specifies the shape of the tool perimeter (which qualifies as one of the list, since it is written as "one or more"). Allowing a user to choose a region to be warped fulfills that limitation of the instant claim. Jennings would clearly therefore allow the user to specify the tool parameter.

According to both Milliron and Jennings, the user can specify movement of the warping tool, e.g. in Milliron the user can clearly specify how the warps will be applied to different points within the source image, which qualifies as 'movement of the warping tool within an image is controlled by user input'. Further, Jennings clearly allows the user to specify regions and move them [0083-0086], particularly [0084]. Next, Jennings shows that the user can specify a bounding box 811 in Figure 8 where the user can add various transformations as desired and then allow the user to continue until they are satisfied with the transformations. Jennings [0095] teaches the "Tools" menu with "Special Effects" of the Jennings tool, further where the user can set various parameters, particularly it should be noted that surface representations can be mapped to the volumetric lattice [0094], therefore allowing the two dimensional application of the tools, and in [0095] again the user applies such techniques using a pointing device, stylus, or series of keyboard commands, such that the user can specify the applied function and its radius and otherwise shape and other details [0102-0105].

Although the warping method of Milliron includes the use of a mesh tool, there is no teaching of receiving user input to specify the tool mesh. Paragraph 64 of Jennings et al. discloses, "The user selects (or activates) the "Warp" computer command, whereupon the system creates an editable mesh corresponding to the surface selected

by the user in FIG. 3A." Note also Jennings [0015], where the user can specify all kinds of applied stimuli, such as simulation results, displacement, warps, forces, data refitting, and a plethora of other techniques.

Finally, both Milliron and Jennings set forth that the region of interest (or the area of the image that the applied vectors and strength fields) cover multiple pixels of the actual image, and that the warping effect is applied to the covered pixels based at least in part on the tool vectors (for example Milliron Figures 5A-5B and all the above discussions of how Jennings allows the user to specify vectors to create such mappings, as well as [0113], where such functions as applied can be vector mappings).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Milliron to include receiving user input specifying the tool mesh as in Jennings et al. One would have been motivated to make such a modification to Milliron so that a user may selectively use the warping program only in instances when a warping function is desired. Additionally, a program running on a typical computer system requires storage in system memory and processing time. By giving a user the ability to activate the warping program when its function is needed instead of having the program constantly run in the background of a graphical editing program, system resources can be preserved. Further, by giving the user the ability to edit the mesh and specify the tool perimeter as well as a region of interest, it allows the user much more flexibility, particularly when doing data remapping [0024-0030]. Further motivation for combination will be discussed in the Examiner's

Answer if applicant wishes to challenge this point, along with accompanying legal analyses and necessary supporting briefs.

As to claim 2,

This section discusses Milliron with respect to claim 2: Paragraph 76 states, "Further in accordance with the illustrative embodiment, a set of feature specifications is used to represent mappings from source to target features. Each of the set of feature specifications comprises a source feature, a target feature, and related deformation parameters for controlling deformation caused by the feature specification. In some instances the number of related deformation parameters might be zero. Again, as noted above, some embodiments of the invention are not feature based and, in such case, a parameter set is used for controlling the warp." As stated above in the rejection of claim 1, a designer inputs the feature specifications for an image region in which to perform a warping function. Paragraph 77 further states, "The invention is not limited to particular types of features. In preferred embodiments a warp designer selects the set of feature specifications; this aspect is limited only by the warp designer's ingenuity." Paragraphs 79 and 80 describe the warp shown in Figures 2A and 2B. A constant translation is calculated to create a deforming function to map a point from a source position to a target position. As can be seen in Figures 2A and 2B, the application of the warping tool and the deforming function modifies the image of Figure 2A with the deforming function so that the image is now located in its new target location as shown in Figure 2B. Paragraph 81 and 82 further describe the use of strength fields in

computing the deformed model by scaling the magnitude of each of the set of transformations over elements of the undeformed model. Paragraphs 92, 93, and 94 describe performing a warping application on oriented points from a source coordinate frame to a target coordinate frame. As stated in Paragraph 94, "The warp designer may describe T_l directly by specifying how it maps frame origins and basis vectors. In addition, the warp designer may describe the transformation as an ordered composition, for instance of translate, rotate, scale, and shear components." Paragraphs 81 through 90 describe the use of scaling and weighting functions and their radial fall-off feature such that their influence over a set of transformations decreases as the distance from the feature in the image increases. Lastly, Paragraph 96 describes performing a warping function to three locations on an image as can be seen in Figures 5A and 5B. Thus, the application of the warping tool defines a translation function used to create a deforming transformation function that corresponds to a distortion vector at each of the one or more image regions. The deforming function is based on the shape, the shape dictating the distance from a scaled source point and another point on the source image and therefore the deforming function at the remote point, and the calculated translation. Furthermore, Milliron applies the warping tool to an image having one ore more image regions in response to user input to define a set of feature specifications. As shown in Figures 2A and 2B and Figures 5A and 5B, the one or more image regions as described above are modified using the corresponding transformation function, thus teaching of modifying the one or more image regions using the corresponding distortion vectors.

As discussed above, Milliron teaches most of the limitations of the above claims. Jennings further teaches as specified in the rejection to claim 1 above the use of user input to the image [e.g. [0083-0084] and the like], the relevant sections of which are incorporated by reference. Further, the image clearly has one or more image regions (any image has at least one region), and it also has a region of interest as specified by Jennings that qualifies under either interpretation of the relevant claim language. The distortion vector is applied as per Jennings [0183] based on user input of the field strength and the like, where both Jennings and Milliron allow the user to specify direction and strength of the warp or other function, where this may be done using underlying tool vectors or the like, where Milliron allows the user to specify transformations as vector quantities for both rotation and other operations – see [0109, 0118, and many other locations].

In regard to claim 3, since Milliron does not pose any limitations on the images with which to deform or warp, it is obvious in the invention of Milliron that the applying and modifying to produce a warping effect can be repeated on an already warped image. However, Milliron does not explicitly disclose the ability to repeat the applying and modifying of a warping function to produce a warping effect. The invention of Jennings et al. discloses a method and system for modeling a virtual object in a computer environment that undergoes transformations as a consequence of a user interacting with the virtual object in which the user may perform multiple modifications to the object. Paragraphs 68 and 69 of Jennings describe the ability of a user to perform a second modification operation on an object that has already undergone a previous modification.

Paragraph 69 states, "The resulting volume 620 can have characteristics that represent the first modification further modified by the second modification. Because the modification process can be performed iteratively, it is possible to apply as many discrete modifications as the user of the system elects to perform. When the user indicates that the result is satisfactory, the system performs the operations of transforming the intermediate representation to a model representation, as discussed with regard to FIG. 4." It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Milliron to include repeating the applying and modifying of an object in response to a warping function to produce a warping effect as in Jennings et al. One would have been motivated to make such a modification to Milliron so that a user may be able to repeatedly modify a source object until they are satisfied with the result of the warping function. Additionally, by allowing a user to perform another warping function on an already warped image, the user may be able to reduce or increase the previous modification if they desire.

In regard to claim 4, Milliron teaches of a system including a display monitor, element 1720 of Figure 1. It is very well known in the art of computer graphics to display a representation of a modified image on a display monitor to allow a user to view the results of a warping function on an image. However, Milliron does not explicitly disclose displaying a representation of the modified image. Jennings et al., as described above, in Paragraph 61 states, "The changes can optionally be visualized by providing a visual representation at any time, including in real time, as the modifications are performed by a user of the system." It would have been obvious to one having

ordinary skill in the art at the time the invention was made to modify the invention of Milliron to include displaying a representation of the modified image as in Jennings et al. One would have been motivated to make such a modification to the invention of Milliron so that a user could visualize the modifications the warping function performs on an object in real time while executing the warp application to determine what the results of the warp will look like.

In regard to claim 5, although the warping method of Milliron includes the use of a mesh tool, there is no teaching of receiving user input to specify the tool mesh. Paragraph 64 of Jennings et al. discloses, “The user selects (or activates) the "Warp" computer command, whereupon the system creates an editable mesh corresponding to the surface selected by the user in FIG. 3A.” It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Milliron to include receiving user input specifying the tool mesh as in Jennings et al. One would have been motivated to make such a modification to Milliron so that a user may selectively use the warping program only in instances when a warping function is desired. Additionally, a program running on a typical computer system requires storage in system memory and processing time. By giving a user the ability to activate the warping program when its function is needed instead of having the program constantly run in the background of a graphical editing program, system resources can be preserved.

In regard to claim 6, Milliron Paragraph 77 states, “The invention is not limited to particular types of features. In preferred embodiments a warp designer selects the set

of feature specifications; this aspect is limited only by the warp designer's ingenuity." Paragraph 79 discloses, "A simple version of the invention will now be described to illustrate basic aspects of the invention. In this version the set of feature specifications consists of a single element and the single element is a point feature. The warp maps the point feature, from its source position, P, to its target position, P'. This transformation is a constant translation, T=P'-P." Additionally, Paragraph 118 states, "An illustrative implementation could involve a warp designer specifying each of n transformations strength field and weighing fields as a vector with m scalar elements (where m is a discrete number of model points, i.e. one value per point)." Thus, Milliron teaches of receiving user input defining a strength and/or direction of the one or more associated vectors. Further, in the discussion of Figures 5A-5B, it is clearly shown how the user specifies direction and strength of the tool vectors, and Milliron clearly allows the user to specify the strength and weighting fields. Jennings additionally allows the user to specify such things in for example Figures 12-13B and [0108-0118]. Finally, Milliron clearly shows in Figures 2A-2B, where a point is mapped to another point, and this clearly illustrates using a **tool** vector, because Milliron teaches the uses of the basis vector and its mapping, which clearly would be the tool vector so required.

In regard to claim 7, Milliron Figure 3A shows an image to be modified with an applied strength field. As noted above in response to claim 6, Milliron teaches of receiving user input defining the strength of the one or more associated vectors. As can be seen in Figure 3A and the resulting modified image of Figure 3B, the distribution for the strength of the transformation is defined to be rotationally asymmetric. Thus,

Milliron discloses receiving user input defining a rotationally asymmetric distribution for the strengths.

In regard to claim 8, Milliron Figure 4A shows an image in which two points are to be modified. As noted above in response to claim 6, Milliron teaches of receiving user input defining the strength and/or direction of the one or more associated vectors. As can be seen in Figures 4A and the resulting modified image of Figure 4B, the distribution for the directions in the warped application are defined to be rotationally asymmetric.

In regard to claim 9, Milliron Paragraphs 216 through 222 describe altering strength fields and weighting fields in a warp application such that they vary over time. Paragraph 216 clearly states, "Many desirable applications of warping in morphing and animation involve controlling the evolution of a warp over time. Yet another aspect of the present invention involves aspects for controlling the evolution of a warp over time." Paragraph 222 further states, "One skilled in the art having the benefit of this disclosure will appreciated that features of the invention may be used to create deformations varying over time through varying, for instance, strength fields, weighting fields, parameterized transformations, or features themselves." Therefore, Milliron includes receiving user input defining a strength and/or direction that change with time.

In regards to claims 10, 11, and 13, Milliron does not teach of specifying the shape of the perimeter of a warping tool. Jennings et al. discloses in Paragraph 73 of selecting a region to be modified by the user. "In different embodiments, the selection step 720 can include, but is not limited to, specification of a sub-volume using an interactively

positioned tool with a region of influence. In one embodiment, the interactively positioned tool is a user-controlled stylus, and a user-controllable radius determines the region of influence. In one embodiment, the position specification of a portion of the model to be modified is performed in conjunction with the projection of a user-positionable two-dimensional image onto the model. In one embodiment, the specification of a portion of the model to be modified is accomplished by drawing a closed curve on the region to be modified, for example using a pointing device such as a mouse or a stylus." Thus, Jennings teaches of allowing a user to specify the shape of the perimeter of an area to be modified by drawing a closed curve on the area. It is well known in the art that a perimeter area drawn by a user with a pointing device may be of any shape including a triangle, square, hexagon, octagon, rhombus, or a rotationally asymmetric shape. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Milliron to include receiving user input specifying the shape of the perimeter of the warping tool as in Jennings et al. One would have been motivated to make such a modification to Milliron so that a user may be able to perform a localized warping function on a subset of an image by drawing the warping tool around the area of interest without affecting the rest of the image. Additionally, element 811 of Figure 8, shows a bounding box in the shape of a square for marking the specified region with which to apply a deformation.

In regard to claim 12, the same basis and rationale for claim rejection as applied to claims 10, 11, and 13 are applied. However, Milliron does not disclose receiving user input specifying a shape of the perimeter and/or a size that changes with time.

Paragraph 77 of Milliron, though, does teach of allowing a warp designer to select feature specifications for performing a warping function. "The invention is not limited to particular types of features. In preferred embodiments a warp designer selects the set of feature specifications; this aspect is limited only by the warp designer's ingenuity." Furthermore, it is obvious to one skilled in the art that specifications for a warp may be time varying. Paragraphs 216 through 222 teach of altering strength fields and other parameters with time. Paragraph 222 states, "One skilled in the art having the benefit of this disclosure will appreciated that features of the invention may be used to create deformations varying over time through varying, for instance, strength fields, weighting fields, parameterized transformations, or features themselves." Thus, Milliron additionally teaches that the features themselves may be time varying in a warping application. It would have been obvious to one having ordinary skill at the time the invention was made to further modify the invention of Milliron to include changing the size or shape of the perimeter of a warping tool with time. One would have been motivated to make such a modification to Milliron so that a warp designer can be further controlling with respect to the warping application. As stated above, the invention of Milliron teaches that the warp designer is able to select the set of feature specifications, limited only by their ingenuity, for performing a warping function. By allowing the shape and/or size of the perimeter of the warping area to vary over time, the warp designer may be better able to perform a localized warping function on a subset of an image without affecting the rest of the image or may create a warp that starts as a localized function then spreads throughout the rest of the image as time progresses. Further, it is

noted that Jennings specifies a triangle-based model and other details, which would at least suggest using a triangular region of interest, as [0055] further suggests using squares or quadrilaterals. Finally, Jennings [0107] clearly teaches that the closed boundary on the isosurface of the model is a four-sided patch boundary, e.g. a quadrilateral.

In regard to claim 14, Figure 2A of Milliron depicts a movement of a point on the warp map, element 2200, from its source location to a target location, element 2300. Figure 2B shows the effect of applying the warp tool in response to a designer input defining a movement of a point in the warp map from a first location to a second location relative to the image, thus corresponding to applying the warping tool in response to user input defining a movement of the warping tool from a first location to a second location relative to the image.

In regard to claim 15, Paragraph 79 of Milliron states, "In this version the set of feature specifications consists of a single element and the single element is a point feature. The warp maps the point feature, from its source position, P, to its target position, P'. This transformation is a constant translation, T=P'-P. Equation 2 represents the resulting deforming function: D(u,M)=T." Paragraph 94 further states, "The warp designer may describe T.sub.i directly by specifying how it maps frame origins and basis vectors. In addition, the warp designer may describe the transformation as an ordered composition, for instance of translate, rotate, scale, and shear components. The particular manner in which the transformation is described is not fundamental and is limited only by the ingenuity of the warp designer." Paragraph 118 describes, "An

illustrative implementation could involve a warp designer specifying each of n transformations strength field and weighing fields as a vector with m scalar elements (where m is a discrete number of model points, i.e. one value per point). Assembling these n m-vectors into an n by m matrix provides an interpretation where each row corresponds to a transformation. The matrix then can be viewed as a matrix of coefficients of a system of equations that can be solved for field or transformation values." Paragraph 119 states, "The sampling function 7450 receives the set of parameterized transformations 7300, the set of strength fields 7350, the set of weighting fields 7400 and the undeformed model 7150 and uses the sampling algorithm to output a set of discretized transformations 7500, a set of sampled strength fields 7550, and a set of sampled weighting fields 7600. The output quantities are defined on a domain of model points U." Lastly, Paragraph 120 states, "These discretized quantities are passed to a 'discretized warp computation' process 7700 that uses Equation 6 to compute the deforming function 7750." Therefore, a deforming function corresponding to a distortion vector is calculated for an image region based on the movement of a point in the warp map from a first location to a second location and one or more associated vectors defining a strength field. Figure 3A shows a movement of a point on the warp map, element 3100, from its source location to a target location, element 3200, in addition to a strength field located at the source location. Figure 3B shows the effect of applying the warp tool in response to a designer input defining a movement of a point in the warp map from a first location to a second location relative to the image and one or more associated vectors defining a strength field.

In regard to claim 16, Paragraph 77 of Milliron states, "The invention is not limited to particular types of features. In preferred embodiments a warp designer selects the set of feature specifications; this aspect is limited only by the warp designer's ingenuity." Paragraph 118 describes, "An illustrative implementation could involve a warp designer specifying each of n transformations strength field and weighing fields as a vector with m scalar elements (where m is a discrete number of model points, i.e. one value per point). Assembling these n m-vectors into an n by m matrix provides an interpretation where each row corresponds to a transformation. The matrix then can be viewed as a matrix of coefficients of a system of equations that can be solved for field or transformation values." Paragraph 220 states, "Yet another approach is to scale the strength fields animated by the morph parameters varying from zero (no deformation) to 1 (full deformation)." Therefore, Milliron teaches of a scale value varying from zero to one with which to scale the associated strength vectors. As stated in Paragraph 77, the warp designer is able to set the specifications of the features to be modified. Thus, Milliron discloses applying the warping tool using a user specified scale factor, the scale factor being used to scale the strengths associated with the vectors.

In regard to claim 17, the same basis and rationale for claim rejection as applied to claim 1 is applied. Additionally, Paragraphs 69 and 70 further describe the invention of Milliron as being tangibly embodied on the computer-usable storage medium, element 1755 of Figure 1, either in source code or compiled form. Paragraph 70 states, "The computer-usable storage medium 1755 having code for suitable configuring the

computer system 1000 to carry on features and/or perform functions in accordance with the invention may be a made and used in any conventional way."

In regard to claim 18, the same basis and rationale for claim rejection as applied to claim 2 is applied. Additionally, Paragraph 70 states, "The computer-usable storage medium 1755 having code for suitable configuring the computer system 1000 to carry on features and/or perform functions in accordance with the invention may be a made and used in any conventional way." Thus, Milliron teaches of configuring a computer system for performing the functions of the invention, thus corresponding to instructions operable to cause the data processing equipment to perform the functions of the invention.

In regard to claim 19, the same basis and rationale for claim rejection as applied to claim 3 is applied.

In regard to claim 20, the same basis and rationale for claim rejection as applied to claim 4 is applied.

In regard to claim 21, the same basis and rationale for claim rejection as applied to claim 5 is applied.

In regard to claim 22, the same basis and rationale for claim rejection as applied to claim 6 is applied.

In regard to claim 23, the same basis and rationale for claim rejection as applied to claim 7 is applied.

In regard to claim 24, the same basis and rationale for claim rejection as applied to claim 8 is applied.

In regard to claim 25, the same basis and rationale for claim rejection as applied to claim 9 is applied.

In regard to claim 26, the same basis and rationale for claim rejection as applied to claim 10 is applied.

In regard to claim 27, the same basis and rationale for claim rejection as applied to claim 11 is applied.

In regard to claim 29, the same basis and rationale for claim rejection as applied to claim 13 is applied.

In regard to claim 30, the same basis and rationale for claim rejection as applied to claim 14 is applied.

In regard to claim 31, the same basis and rationale for claim rejection as applied to claim 15 is applied.

In regard to claim 32, the same basis and rationale for claim rejection as applied to claim 16 is applied.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Perez et al, US PGPub 2004/0165788, which clearly teaches the user being able to modify the tool perimeter and change shape/size and all of these limitations. Note that this art **will** be applied upon the return of this case; if applicant attempts to introduce new limitations in an after-final amendment, examiner reserves the right to make new grounds of rejection in the Examiner's Answer to address such changes, and

these **would** use the Perez reference, particularly if applicant disputes any points of the applicability or teachings of the Jennings reference. [Assuming of course that such amendments were proper and received entry]. Applicant is further put on notice that examiner may put new, additional grounds of rejection in the Examiner's Answer against the independent claims utilizing the Perez reference anyway.

Note also Kallioniemi, US PGPub 2004/0085443.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric V. Woods whose telephone number is 571-272-7775. The examiner can normally be reached on M-F 7:30-4:30 alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 571-272-7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric Woods

26 November 2005

MICHAEL RAZAVI
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